SONY

3-753-337-21 (1)

Stereo Cassette Deck

Operating Instructions

TC-WR87ES

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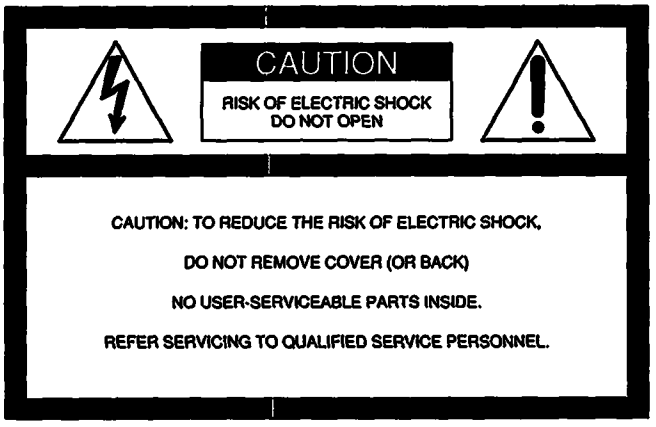
WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK)
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

* The graphical symbols are on the rear enclosure.

INFORMATION

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient the receiving antenna
Relocate the equipment with respect to the receiver
Move the equipment away from the receiver
Plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems".

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

Owner's Record

The model and serial numbers are located at the rear. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No.TC-WR87ES Serial No. _____

Table of Contents

Getting Started

Features 3
Precautions 4
Installation 4
Connections 5
Identification of front panel parts 6

Playback

Playing back 7
Playing back both decks in succession — Relay Play 8
Skipping blanks — Blank Skip 9
Playing back automatically after rewinding
— Auto Play 9
Locating a selection
— Automatic Music Sensor (AMS) 10
Locating a desired position using the counter
— Memory Play 11
The accuracy of the digital linear counter 11

Recording

Recording 12
Adjusting the recording level 13
Recording FM Broadcasts with the Dolby
NR System 13
Adjusting the bias according to the
tape type (deck B only) 13
What is the Dolby HX PRO system? 14
To protect a recording 14
Recording the same source on both decks
— Simultaneous Recording 15
Recording on both decks in succession
— Relay Recording 16
Inserting a blank space during recording
— Record Muting 16

Dubbing

Dubbing a tape 17
Dubbing only desired selections 18
Dubbing only desired portions 18

Timer-Activated Playback and Recording

Timer-activated playback and recording 19

Maintenance 20
Specifications 20
Troubleshooting guide 21

Features

For higher quality recording/playback

- **The Dolby HX PRO* system** which improves the linearity of the tape's high-range response during recording.
- **B and C type Dolby NR* systems** which reduce tape noise.
- **Bias calibration** to achieve the optimum bias current setting for any tape.

For your convenience

- **Automatic tape type detection** during playback and recording.
- **The AMS, Blank Skip and Memory Play functions** which provide easy access to a desired selection.
- **A relay function** for long recording and playback.
- **Auto Play function** which automatically starts playback after tape rewinding to start.
- **Timer-activated playback and recording** through the use of an optional timer.
- **Synchronized dubbing** at normal or high speed.
- **Simultaneous Recording function** for the simultaneous recording of the same source to cassettes in both decks.

For easier operation

- **Twin easy-to-read digital linear counters** which show the elapsed recording or playing time on each deck.
- **An optional remote control unit** which allows various operations to be remotely controlled.

* Dolby noise reduction and HX Pro headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX Pro originated by Bang & Olufsen.

"DOLBY", the double-D symbol ⧈ and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.

Precautions

On safety

- Operate the unit only on 120 V AC, 60Hz.
- Before operating the unit, be sure that the operating voltage of your unit is identical with that of your local power supply
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Unplug the unit from the wall outlet if it will not be used for a long time. To disconnect the cord, pull it out by grasping the plug. Never pull the cord itself.

On operation

- When the unit is not used, turn the power off to conserve energy and to extend the useful life of your unit.
- Because of a safety mechanism, the function buttons will not operate if the cassette holder is not completely closed, if there is no cassette in the cassette holder, or if a cassette has been incorrectly inserted into the cassette holder.

On head cleaning

The head and tape path should be cleaned after every ten hours of operation. Dirty heads and a dirty tape path may cause:

— loss of high-frequency response
— loss of sound volume
— sound drop-out

If you have any questions or problems concerning your unit, please contact your nearest Sony dealer.

For detailed safety precautions, see the leaflet "IMPORTANT SAFEGUARDS".

Installation

Notes on Installation

- Place the unit with the front panel facing you in a location with adequate air circulation to prevent overheating of the unit.
- Do not place the unit:
  — near heat sources such as radiators or air ducts.
  — in places subject to direct sunlight, excessive dust, mechanical vibration or shock.
  — in an inclined position.
  — on a rug or other soft surfaces that would block the ventilation holes on the bottom of the unit.

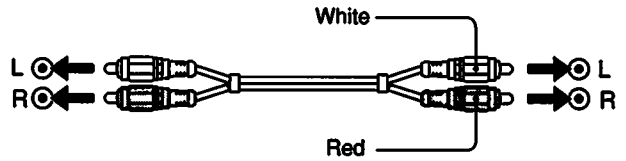
Do not throw away the carton and the packing material

They will come in handy when transporting the unit or shipping it for servicing.

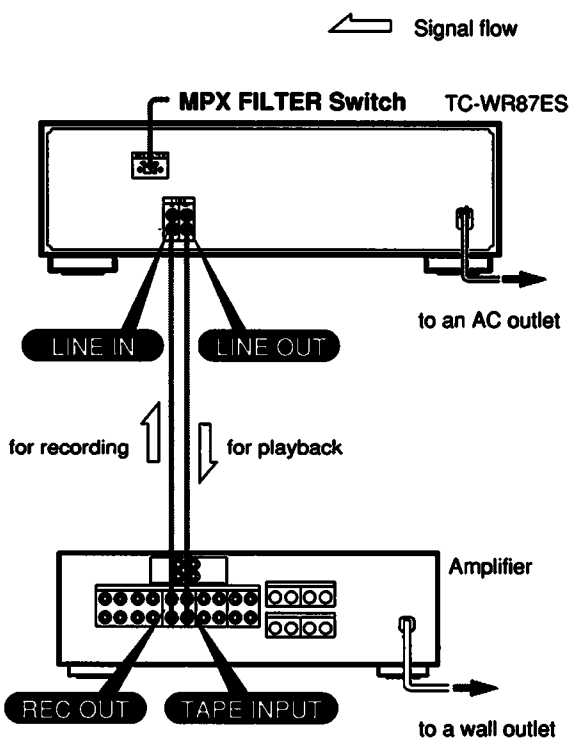
Connections

Notes on Connections

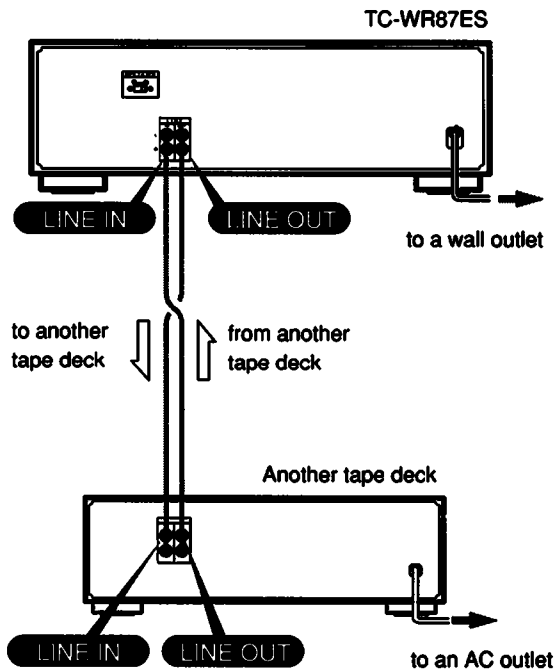
- Turn off the power to all equipment to be connected before making any connection.
- Note that the red plug of the supplied connecting cord is for right-channel (R) connection and the white plug for left-channel (L) connection.
- The connecting cords should be fully inserted into the jacks. A loose connection may cause hum pickup.



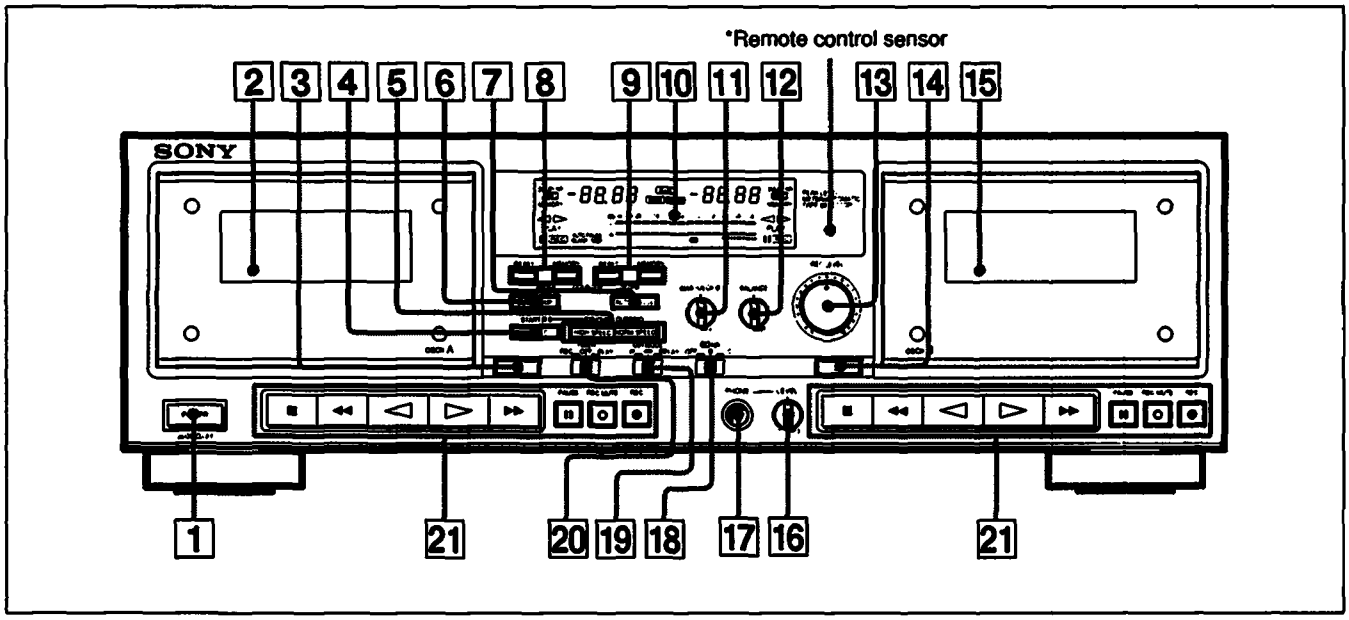
Basic Connection



Connection for Tape Dubbing



Identification of Front Panel Parts



For details, refer to the page number indicated in ● .

1 **POWER switch**

2 **Deck A**

3 **⏏ (eject) button (deck A)**

4 **A+B REC (simultaneous recording) button** ⓯

5 **SYNCHRO DUBBING buttons** ⓱
HIGH SPEED button
NORM (normal) SPEED button

6 **BLANK SKIP button** ⓽

7 **AUTO PAUSE button** ⓲

8 **COUNTER buttons (deck A)** ⓫
RESET button
MEMORY button

9 **COUNTER buttons (deck B)** ⓫
RESET button
MEMORY button

10 **Display panel**

11 **BIAS control (deck B)** ⓳

12 **BALANCE control** ⓬

13 **REC (recording) LEVEL control** ⓬ ⓯

14 **⏏ (eject) button (deck B)**

15 **Deck B**

16 **Headphones LEVEL control** ❼

17 **PHONES (headphones) jack (stereo phone jack)** ❼

18 **DD NR (Dolby noise reduction) switch** ❼ ⓬ ⓯ ⓰

19 **DIR (direction) MODE switch** ❼ ❽ ⓬ ⓯ ⓰ ⓱

20 **TIMER switch** ❼ ⓳

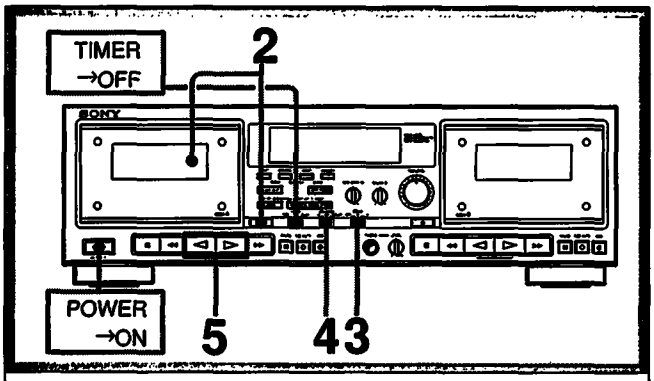
21 **Tape operation buttons**
■ *(stop) button*
◀◀ (leftward fast winding) (AMS**) button
◀ (reverse play) button
▶ (forward play) button
▶▶ (rightward fast winding) (AMS**) button
❚❚ PAUSE button
○ REC MUTE (record muting) button ⓰
● REC (recording) button

***Remote control sensor**
You can remotely control this cassette deck with:
—A remote commander that came with a Sony amplifier or receiver if it has the ■ mark and cassette deck control capability.
—Any optional Sony remote commander with the ■ mark and cassette deck control capability.

**AMS is an abbreviation for Automatic Music Sensor.

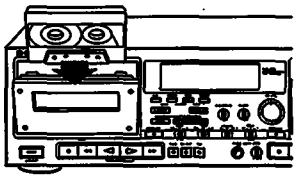
Playing Back

Follow the procedure below to play back a cassette on deck A or B.



1 Turn on the amplifier and select the tape function.

2 Insert a cassette.



3 Set DOLBY NR to the same position that was used when the cassette was recorded.

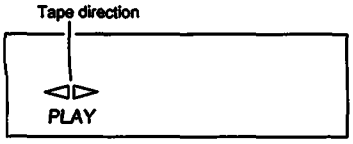
4 Select the direction mode.

To play back to the end of one side only	
To play back both sides continuously*	

* After playing back five times, the deck automatically stops.

5 Start playback.

From the front side	
From the reverse side	



To stop playback, press the ■ button.
To stop playback momentarily, press the ❚❚ button.
To restart play, press the ❚❚, ◄ or ► button.
To fastwind a tape rightward, press the ►► button in stop mode.
To fastwind a tape leftward, press the ◄◄ button in stop mode.

The TIMER switch must be set to OFF
Otherwise, recording or playback will start automatically when the power is turned on.

Is it necessary to set the tape type being used?
No. Each deck has an automatic tape type detection system.

To change to recording mode during playback
Keeping the ◄ or ► button pressed, press the ● button. The unit immediately switches from playback to recording without stopping the tape. This is useful when editing previously recorded material.

When decks A and B are in playback mode
Only playback from deck A will be audible.

If fast winding starts in the middle of a selection
The Blank Skip function (see page 9) is activated (the BLANK SKIP indicator is on). Press the BLANK SKIP button to deactivate the function.

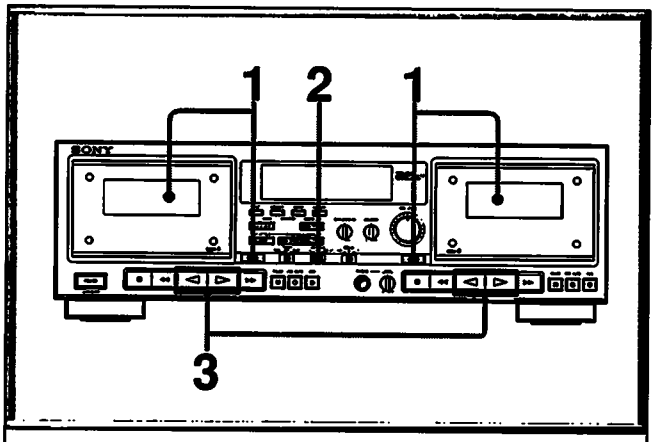
For headphone listening
Connect the headphone plug to the PHONES jack. Listening level can be controlled with the LEVEL control.

What is the Dolby NR system?
The Dolby NR (noise reduction) system reduces tape hiss noise in low-level, high-frequency signals by boosting the signals during recording and lowering them during playback.

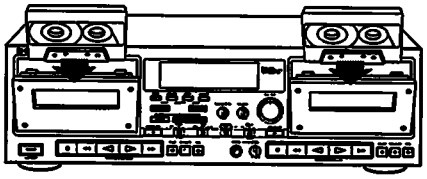
Note
The Dolby HX PRO system is effective only during recording, not during playback.

Playing Back Both Decks in Succession — Relay Play

The Relay Play function plays back cassettes in deck A and deck B continuously and in consecutive order.



1 **Insert cassettes into both decks.**



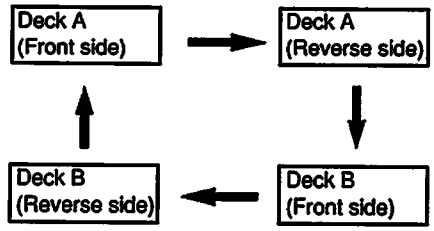
2 **Set the direction mode to RELAY.**

3 **Start playback of the cassette to be listened to first.**

From the front side	
From the reverse side	

To stop relay play
Press the ■ button of the deck playing.

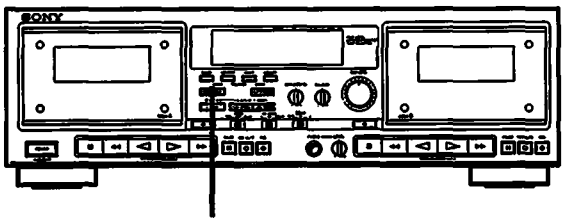
Playback sequence of relay play
Relay play always follows the sequence below regardless of where playback starts.
After playing back five times, Relay Play automatically stops.



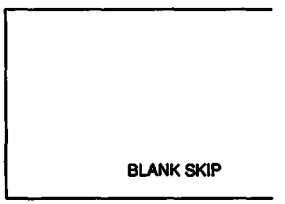
Playing back more than two cassettes in succession
Replacing cassettes that have finished playing with new ones allows you to play back two or more cassettes alternately on each deck.

Skipping Blanks
— Blank Skip

The Blank Skip function fast winds the cassette when a blank space of ten seconds or more is encountered, then resumes playback when a recorded portion is detected.



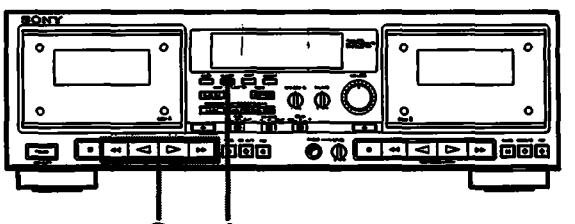
Activate the Blank Skip function.



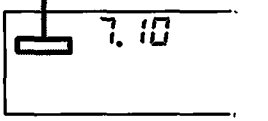
To deactivate the Blank Skip function
Press the BLANK SKIP button, turning off the BLANK SKIP indicator.

Playing Back Automatically after Rewinding — Auto Play

The Auto Play function automatically starts playing back a cassette after fast winding it to the beginning.

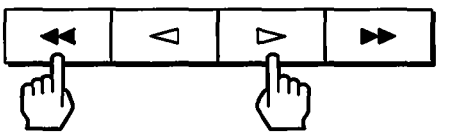


1



Make sure the MEMORY indicator of the deck to be used is off.
If it is not, press MEMORY.

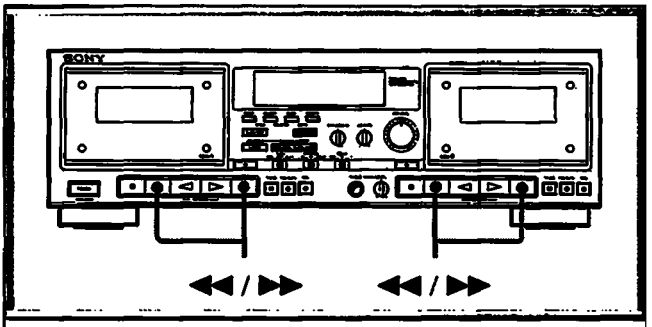
2



From the beginning of...	While pressing...
front side	▶, press ◀◀.
reverse side	◀, press ▶▶.

Locating a Selection
— Automatic Music Sensor (AMS)

The AMS function detects the blank space between selections, allowing you to quickly locate the beginning of desired selections.



During playback, check the direction indicator and press ▶▶ or ◀◀ referring to the following table.

Direction Indicator	Desired selection	
	Next selection	Selection being played
▷ PLAY	▶▶	◀◀
◁ PLAY	◀◀	▶▶

The PLAY indicator flashes while the AMS searches for the beginning of the selection. After locating the beginning of the selection, playback will start automatically.

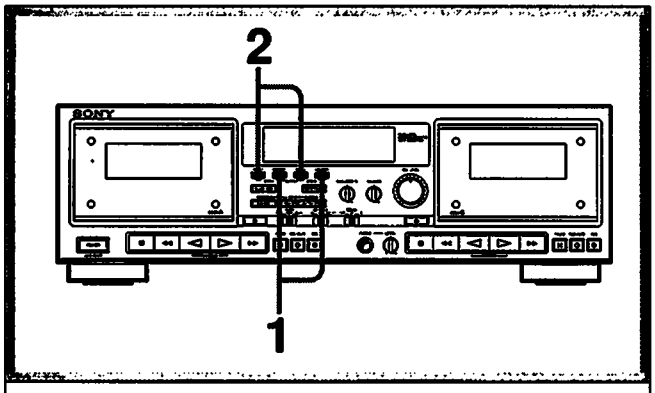
The AMS may skip a selection in the following cases:
- If the ▶▶ (or ◀◀) button is pressed immediately before the following selection.
- If there is noise in the space between selections.
- If the space is less than four seconds long.

The AMS will treat the following as blanks:
- a long pause in the music
- a passage of low frequencies or very low volume
- a gradual increase or decrease in volume

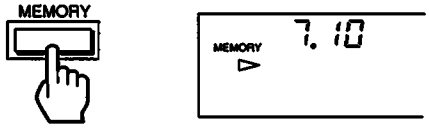
The AMS does not function on both decks simultaneously
- The AMS is activated for the deck whose ▶▶ or ◀◀ button is pressed first.
- If the AMS is activated for deck B during playback on deck A, deck B fast winds to the beginning of the selection and stops.
- If the AMS is activated for deck A during playback on deck B, deck A fast winds to the beginning of the selection and begins playback. The sound from deck B will be cut off when playback begins on deck A.

Locating a Desired Position Using the Counter
— Memory Play

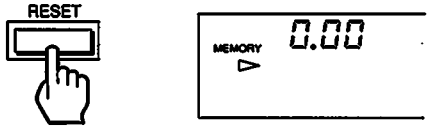
The Memory Play function allows you to use the counter to record a desired position on a cassette for fast relocation and automatic playback later.



1 Activate the Memory Play function of the deck to be used.



2 At the desired position, reset the counter.



To return to the desired position
Check the direction indicator and press the respective buttons shown below.

Direction Indicator	While pressing...
▷ PLAY	►, press ◀◀.
◁ PLAY	◀, press ▶▶.

Returning to the memorized position in stop mode — Memory stop
If you press only the ◀◀ or ▶▶ button when the MEMORY indicator is on in the stop mode, the tape rewinds and the unit stops when the counter reaches 0.00.
Be sure to first stop playback before activating the Memory Stop function, otherwise the AMS function will activate.

To deactivate the Memory Play function
Press the MEMORY button, turning off the MEMORY indicator.

The Accuracy of the Digital Linear Counter

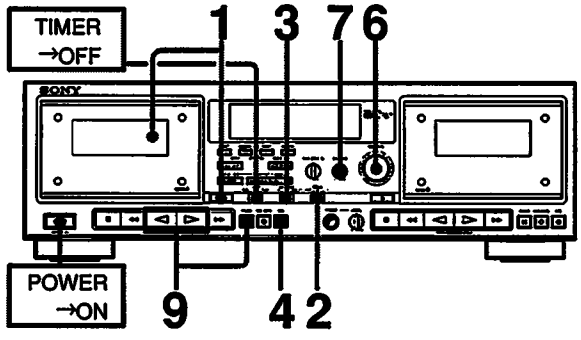
Since the counter is not a digital clock, the number will differ from the actual elapsed playback or recording time by a few minutes, depending on such factors as tape length and hub size.
When decks A and B are operated at the same time, slight differences in tape length (even in the case of identical tape types) and running speeds will result in a difference of a few minutes between both counters.

Note on Memory Play/Stop
In actuality, the tape is rewound to slightly short of 0.00.

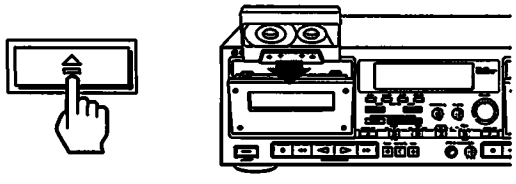
Do not turn off the power while using the counter
Turning the power off, then on again resets both counters to 0.00.

Recording

Follow the procedure below to record a source on a cassette in deck A or deck B.

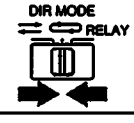


1 Insert a cassette into the desired deck.



2 Set the Dolby NR setting.

3 Select the side(s) to be recorded.

To record on one side	
To record on both sides	

4 Place the unit into recording pause mode.

5 Play the program source to be recorded.

6 Adjust the recording level.

See Adjust the Recording Level on page 13.

7 Adjust the balance.

8 Restart the program source, if required.

9 Start recording.

To record on the front side of the cassette	
When ▷ is on	Press ► once or ❚❚.
When ◁ is on	Press ► twice.
To record on the reverse side of the cassette	
When ◁ is on	Press ◄ once or ❚❚.
When ▷ is on	Press ◄ twice.

To stop recording
Press the ■ button.

Note on step 3
Even at the ⇦ position, recording automatically stops when the tape reaches the end of the reverse side.

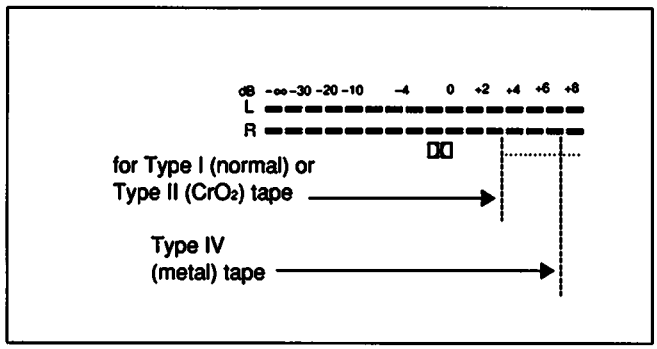
Note on step 4
The direction indicator for the side opposite the specified one will blink for three seconds to indicate that recording is possible on that side also. If, however, the tab for that side has been removed to prevent recording, the indicator will not blink. If the tab has been removed from either side A or B, recording is impossible on this side(s).
To recover a cassette for recording, cover the respective slot with tape. See "To Protect a Recording" on page 14.

Note on step 9
Pressing the ◄ or ► button twice will cause the unit first to change tape direction and then start recording in that direction.

Adjusting the Recording Level

The optimum recording level, which differs according to the tape type, is indicated on the PEAK LEVEL METER for each tape type.
Adjust the REC LEVEL control as high as possible without exceeding the recommended range for the tape type being used.

Recommended maximum PEAK LEVEL METER reading



Tips on recording level adjustment

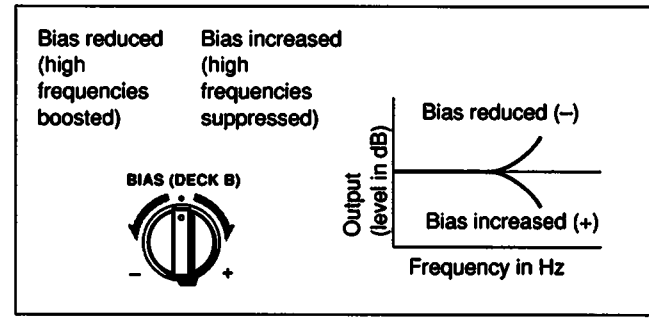
- If the recording level setting is too high, the recording will be distorted; if it is too low, the tape will produce a hissing sound. Therefore, the recording level should be set as high as possible without causing distortion.
- If the program source to be recorded has many high frequency signals, set the level to a relatively low position.

Recording FM Broadcasts with the Dolby NR System

When recording FM broadcasts with the DOLBY NR system, set the MPX FILTER switch on the rear panel to ON.
The MPX filter eliminates remnants of the 19 kHz stereo carrier and 38 kHz subcarrier signals which may impair the operation of the DOLBY NR system. Be sure that the Dolby NR switch is turned on since the MPX filter will not function otherwise. During recording with the Dolby NR system, use this switch only if the tuner is not equipped with its own MPX filter or the equipped filter does not function effectively.

Adjusting the Bias According to the Tape Type (Deck B Only)

To obtain the optimum frequency response, use the BIAS control to adjust the bias current according to the tape type being used. Reducing the bias boosts high frequencies but increases distortion. Increasing the bias decreases distortion but suppresses high frequencies. Balance the bias according to your listening preference.

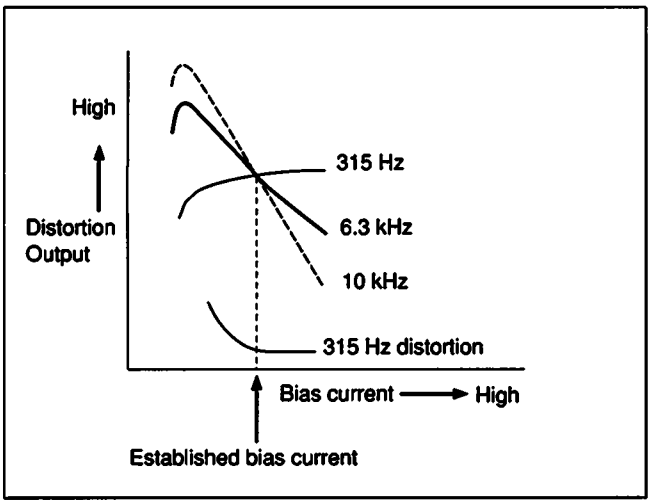


Note
In the case of Type IV cassette tapes, the frequency change for any given bias setting will be minimal.

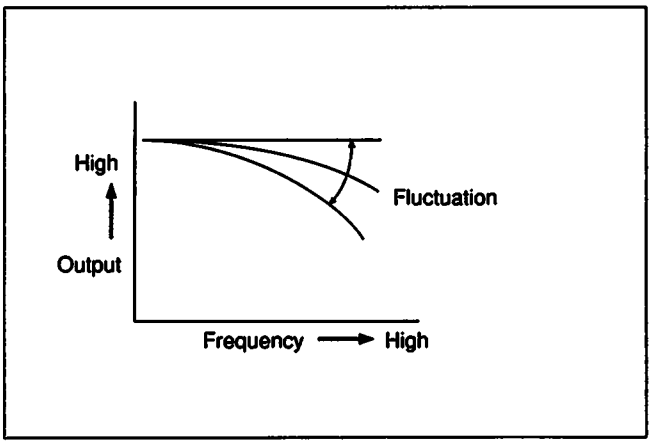
Recording

What is the Dolby HX PRO system?

The Dolby HX PRO system provides linearity in high-range frequency response during recording. Tapes recorded with this system retain the same high quality even when played back on other tape decks.



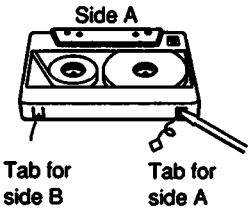
As shown above, characteristics such as output level and distortion differ widely according to the bias (high-frequency) current. In conventional systems, the bias current is susceptible to variations in certain recording signals (see diagram below) which may cause fluctuations in frequency response, distortion, or other unwanted characteristics.



With the Dolby HX PRO system, the effective bias amount added to the bias current is controlled in millisecond units to greatly reduce distortion, improving linearity in high-range response and ensuring high-intensity recording with minimal distortion and noise.

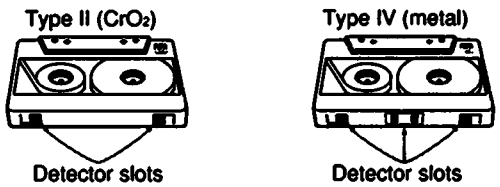
To Protect a Recording

To protect a recording on side A or B
Break out the respective tab.



To recover a cassette for recording
Cover the respective slot with tape.

When using Type II (CrO_2) or Type IV (metal) cassettes
Be careful not to cover the detector slots which are necessary for automatic tape type detection.



Cassette Care

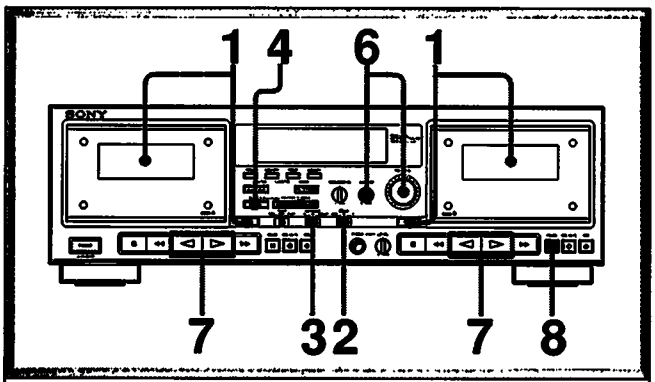
- Avoid touching the tape surface of a cassette to prevent contamination of the heads by dirt, dust, or oil on the skin.
- Keep cassettes away from equipment with magnets, such as speakers and amplifiers, as erasure or distortion of the recorded tape could occur.
- Do not expose cassettes to direct sunlight, extremely cold temperatures, or moisture.

Note on cassettes longer than 90 minutes
The use of cassettes longer than 90 minutes is not recommended except for long continuous playback.

Recording the Same Source on Both Decks

— Simultaneous Recording

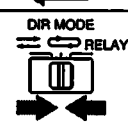
The Simultaneous Recording function allows you to record the same source on cassettes in decks A and B at the same time.



1 **Insert cassettes for recording into both decks.**

2 **Select the Dolby NR setting.**

3 **Select the side(s) to be recorded.**

To record on one side only	
To record on both sides	

4 **Place both decks into recording pause mode.**

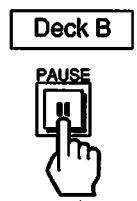
5 **Play the program source to be recorded.**

6 **Adjust the recording level and balance.**
(See pages 12 and 13.)

7 **Select the side from which to start recording.**

From the front side	
From the reverse side	

8 **Start recording.**



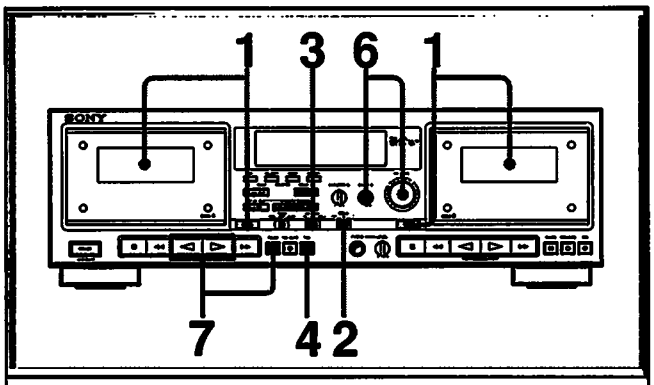
To stop Simultaneous Recording
Press the ■ button on the respective deck.

If the A + B REC indicator blinks three times
A tab is missing for one of the sides selected for recording. Cover the slot with tape (see page 14).

Using the pause and record muting buttons during Simultaneous Recording
Pressing the II or ○ button on deck B during Simultaneous Recording activates the respective function on both decks at the same time. The II and ○ buttons on deck A are disabled during Simultaneous Recording.

Recording on Both Decks in Succession
— Relay Recording

The Relay Recording function can be used to make a continuous recording that starts on a cassette in deck A and ends on a cassette in deck B.

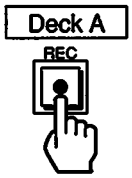


1 **Insert cassettes for recording into both decks.**

2 **Select the Dolby NR setting.**

3 **Set the direction mode to RELAY.**

4 **Place deck A into recording pause mode.**



5 **Play the program source to be recorded.**

6 **Adjust the recording level and balance.**
(See pages 12 and 13.)

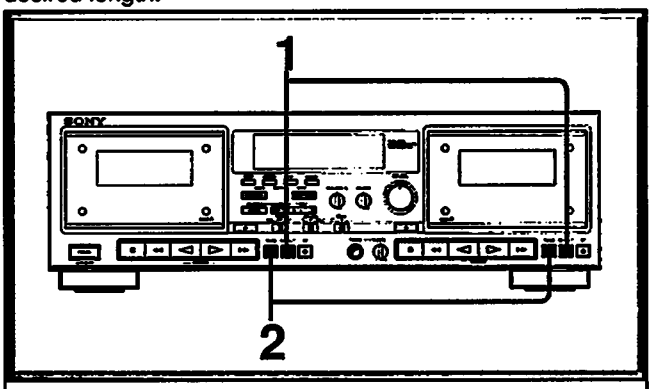
7 **Start recording on deck A.**

To record on the front side of the cassette	
When ▷ is on	Press ► once or ❚❚.
When ◁ is on	Press ► twice.
To record on the reverse side of the cassette	
When ◁ is on	Press ◄ once or ❚❚.
When ▷ is on	Press ◄ twice.

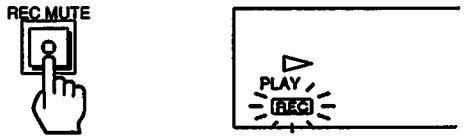
To stop Relay Recording,
Press the ■ button on the deck which is recording.

Inserting a Blank Space during Recording
— Record Muting

The Record Muting function allows you to insert a four-second blank to enable proper AMS operation (see page 10), and to replace unwanted input with a blank of any desired length.



1 **While recording, press O and release it immediately.**



The REC indicator starts to blink. During this time, no incoming signals are recorded on the tape.
After four seconds, the ❚❚ indicator lights up and the unit enters recording pause mode.

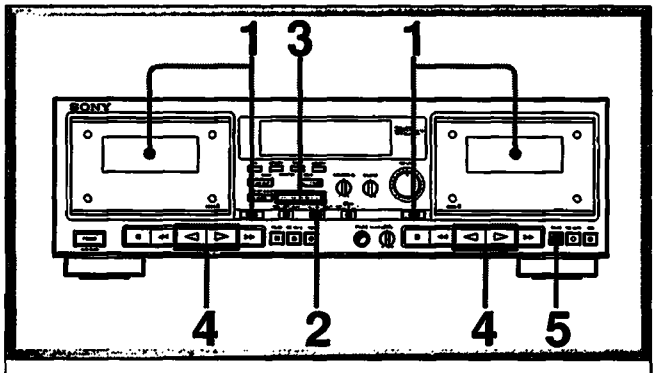
2 **Resume recording.**

To create a blank longer than four seconds,
Press the O button for the desired length of time.
After four seconds, the REC indicator blinks with greater rapidity. When you release the O button, the ❚❚ indicator lights up and the deck goes into recording pause mode.
Press the ❚❚ button to resume recording.

Relay Recording on reverse side of the cassette in deck A has finished
Recording continues on deck B in the direction of the current tape direction indicator. When ◁ is on, Relay Recording stops when the reverse side comes to an end.

Dubbing a Tape

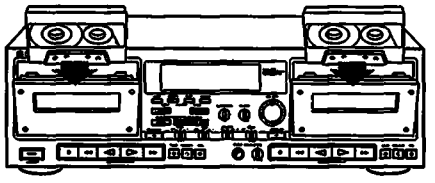
High-speed dubbing allows you to dub a tape in deck A to a tape in deck B without making adjustments. High speed dubbing is convenient for dubbing entire tapes while normal-speed dubbing is handy for tape editing.



1 Insert cassettes.

Deck A — Recorded tape

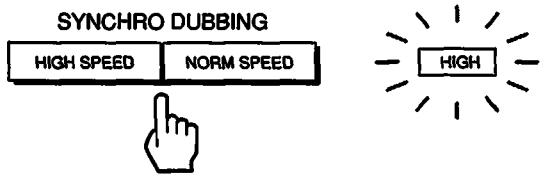
Deck B — Blank tape



2 Select the direction mode.

One side		
Both sides		Dubbing of the reverse side starts independently of deck A.
		Dubbing of the reverse side starts simultaneously with deck A.

3 Select the dubbing speed.



4 Select the side on which to start dubbing.

From the front side	
From the reverse side	

5 Start dubbing.

To stop dubbing

During normal-speed dubbing, press the ■ button on deck B.

During high-speed dubbing, press the ■ button on either deck A or B.

During high-speed dubbing

Only the ■ button is operative.

If the NORMAL or HIGH SPEED indicator blinks three times

Either one or both tabs of the cassette inserted into deck B have been removed, making dubbing impossible for that side. Cover the slot(s) with tape (see page 14).

Is it necessary to adjust the recording level and select the Dolby NR system?

It is unnecessary since the tape in deck B is automatically recorded with the same recording level and Dolby noise reduction system as the original in deck A.

The Dolby system must, however, be set to match the tape in deck A when the sound is monitored during normal-speed dubbing .

Using the Blank Skip function during tape dubbing

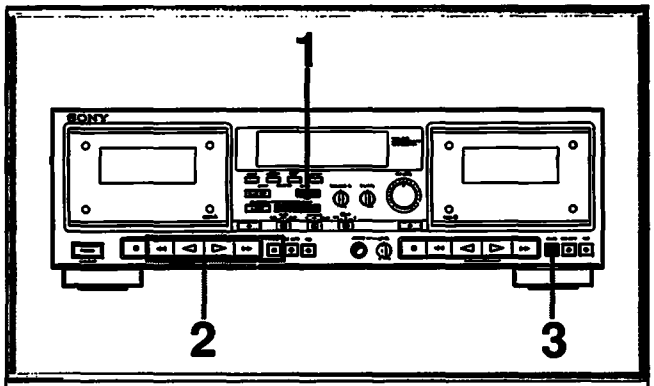
Pressing the BLANK SKIP button will activate the Blank Skip function and turn on the BLANK SKIP indicator. When a blank of ten seconds or more is encountered, dubbing will stop while the unit fast winds to the next recorded portion. When one is found, dubbing resumes.

Notes on tape dubbing

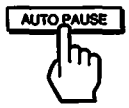
- Do not change the dubbing speed setting during tape dubbing.
- If the sound is affected by the proximity of a television set during high-speed dubbing, turn the television set off or move it away from the deck.

Dubbing Only Desired Selections

Follow the procedure below to dub from the beginning of desired selections. Note that this is possible only in the normal-speed dubbing mode.

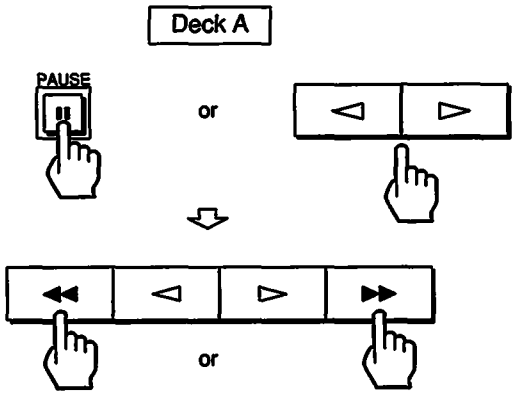


1 Press AUTO PAUSE before or during normal-speed dubbing.

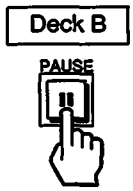


Each time one playback selection on deck A ends, deck A goes into the pause mode and deck B goes into the recording pause mode.

2 Locate the desired selection (page 10).



3 Resume dubbing.

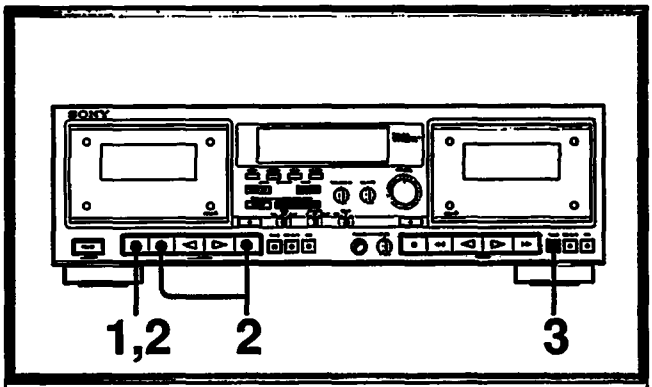


To deactivate the Auto Pause function
Press the AUTO PAUSE button again.

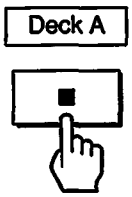
The Auto Pause function will not operate
If the space between selections is too short or contains noise.

Dubbing Only Desired Portions

Follow the procedure below to dub only desired portions of selections. Note that this is only possible in the normal-speed dubbing mode.

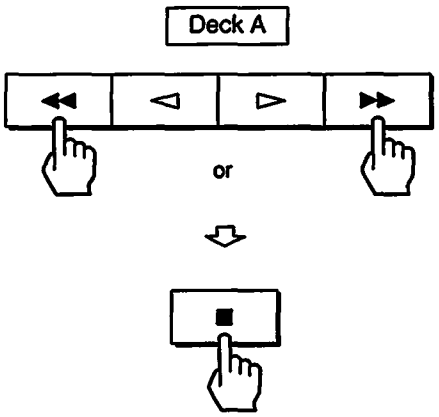


1 At the start of a selection to be skipped:

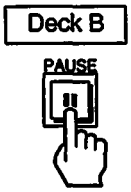


Deck A enters the stop mode and deck B enters the recording pause mode.

2 Locate the desired portion.

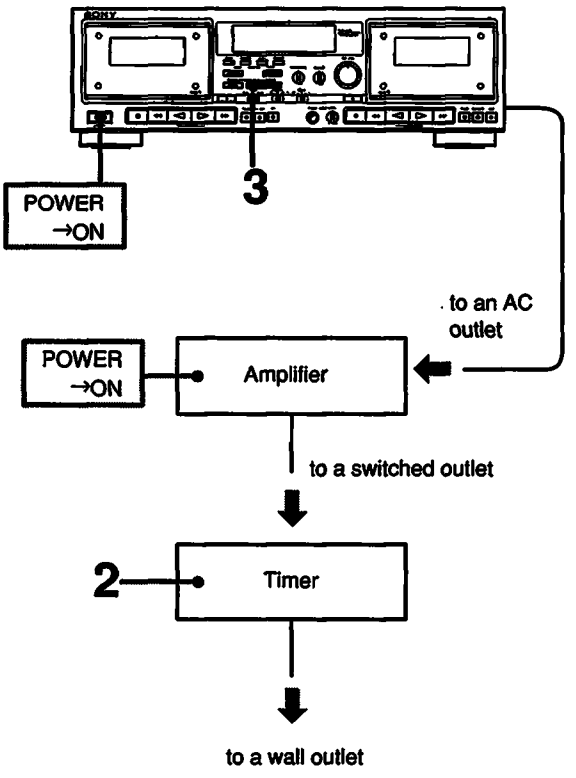


3 Resume dubbing.



Timer-Activated Playback and Recording

By connecting a commercially available timer, automatic recording or playback can be performed at a preset time.



1 Prepare the unit for playback or recording

To playback	For single-deck playback, see page 7. For Relay Play, see page 8.
To record	For single-deck recording, see page 12. For Simultaneous Recording, see page 15. For Relay Recording, see page 16.

2 Set the timer to the desired time.
Power to the unit will be cut off.

3 Set the TIMER switch on the unit to PLAY or REC.
Playback or recording will start at the preset time.

Check the direction mode indicator
Timer-activated operations start from the side of the cassette being used when the power was turned off. However, for Relay Play, playback on deck B always starts from the front side.

For single-deck recording
Be sure that only one cassette is inserted into either deck A or deck B for single-deck recording. If a second cassette is inserted and the DIR MODE switch is set to ⇄ or ⇨, Simultaneous Recording will occur and both tapes will be erased.

Make sure the cassette holder is closed
If the cassette holder is left open, recording or playback will not activate at the desired time.

Keep the POWER switch on the unit on
When the timer is set, the power of the unit will be cut off. However, the POWER switch must be on to start the timer-activated operation.

When the timer-activated operation is completed
Set the TIMER switch on the unit to OFF. If the TIMER switch is left at REC, the unit will automatically start recording the next time the power is turned on, and the previously recorded material may be erased.

Maintenance

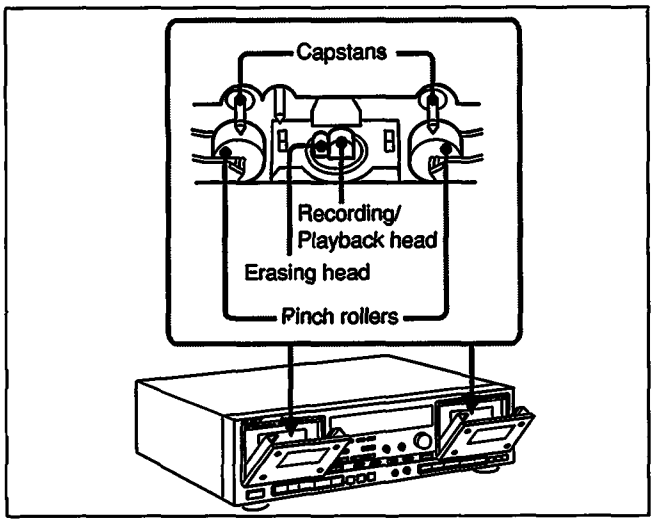
Cleaning the Heads and Tape Path

Clean all surfaces over which the tape travels after every ten hours of operation to guard against:
— low-quality sound
— a decrease in sound level
— excessive wow, flutter or drop-out
— incomplete erasure
— impairment of recording function

To obtain high-quality recorded sound, cleaning before every recording is recommended.

1 Press the ⏏ button to open the cassette holder. Grasp the front holder on both sides and gently lift to remove it.

2 With the unit turned off, wipe the heads, the pinch rollers and the capstans with a cotton swab slightly moistened with alcohol or a commercially available cleaning fluid for tape decks.



3 Replace the cassette holder.

Do not insert a cassette until the cleaned areas are completely dry.

Demagnetizing the Heads

After 20 to 30 hours of use, or when you notice hiss and/or loss of high frequencies, the residual magnetism built up on the heads should be removed.

1 Turn off the power.

2 Demagnetize the heads with any commercially available demagnetizer.

Refer to the instruction manual of the demagnetizer for detailed instructions.

Cleaning the Cabinet

Clean the cabinet, panel and controls with a soft cloth slightly moistened with a mild detergent solution.
Do not use any type of abrasive pad, scouring powder or solvents such as alcohol or benzine.

Specifications

Recording system	4-track 2-channel stereo
Fast winding time	Approx. 90 sec. (with Sony C-60 cassette)
Bias	AC bias

Signal-to-noise ratio (at peak level)

Dolby NR switch / Cassette	OFF	B-Type ON	C-Type ON
Type IV (Sony METAL-SLT)	59 dB	67 dB	74 dB
Type II (Sony UX-S)	58 dB	66 dB	73 dB
Type I (Sony HF-S)	56 dB	64 dB	71 dB

Total harmonic distortion 1.0% (with Sony METAL-SLT cassettes)

Frequency response (DOLBY NR OFF)

Type IV cassette (Sony METAL-SLT)	30 - 18,000 Hz (±3 dB, IEC) 30 - 15,000 Hz [±3 dB 0VU(-4 dB)recording]
Type II cassette (Sony UX-S)	30 - 17,000 Hz (±3 dB, IEC)
Type I cassette (Sony HF-S)	30 - 15,000 Hz (±3 dB, IEC)

Wow and flutter ±0.13% W.Peak (IEC)
0.07% WRMS (NAB)
±0.18% W.Peak (DIN)

Inputs

Line inputs (phono jacks)	Sensitivity	77.5 mV
	Input impedance	47 k ohms

Outputs

Line outputs (phono jacks)	Rated output level	0.32 V at a load impedance of 47 k ohms
	Load impedance	Over 10 k ohms
Headphones (stereo phone jack)	Output level	0–1.25 mW at a load impedance of 32 ohms

General

Power requirements	120 V AC, 60 Hz
Power consumption	30 W
Dimensions	Approx. 430 × 135 × 300 mm (w/h/d) (17 × 5⅜ × 11⅞ inches) including projecting parts and controls
Weight	Approx. 5.3 kg (11 lbs 11 oz)

Supplied accessory Audio connecting cords (2)

Design and specifications subject to change without notice.

Troubleshooting Guide

The following trouble checks will help you correct the most common problems encountered with your tape deck. Should any problems persist after you have made these checks, consult your nearest Sony dealer.
Before proceeding with these trouble checks, verify that:

- The power cord is firmly connected.
- Amplifier connections are firmly made.
- Heads, capstans and pinch rollers are clean.
- The amplifier controls and switches are set correctly.

Function buttons and tape transport problems

Symptom	Cause	Remedy
The function buttons do not activate.	The cassette holder is not fully closed.	Close the holder completely.
	The cassette is not properly inserted.	Insert cassette correctly.
	Button was pressed immediately after power was turned on.	Wait until the ▮▮ indicator stops blinking.
Playback or recording begins when the power is turned on.	The TIMER switch is not set to OFF.	Set the TIMER switch to OFF.
The ● button does not activate.	There is no cassette in the holder.	Insert a cassette.
	A tab has been removed from the cassette.	Cover the slot with tape (page 14).
Automatic shut-off mechanism activates before the tape comes to its end.	The tape is slack.	Take up the tape slack.
	The cassette shell is deformed.	Use another cassette.
	The Memory Play function is activated.	Press the MEMORY button to deactivate the function.
Excessively loud tape transport noise during fast winding.	This noise is caused by the cassette and does not signify a mechanical problem.	—
The ⏏ button does not function.	This occurs when the unit is playing back or recording.	Press the ■ or ▮▮ button to stop playing back or recording first.

(continued on next page.)

Troubleshooting Guide

(Continued from previous page.)

Recording and playback problems

Symptom	Cause	Remedy
Recording or playback cannot be made or there is a decrease in sound level.	The recording/playback and erasing heads are either dirty or magnetized.	Clean or demagnetize the heads.
	Improper connection.	Make connections properly (page 5).
	Improper setting of the amplifier controls.	Set the amplifier controls to the appropriate positions.
Excessive wow, flutter or dropout.	The head, capstan or pinch roller is dirty.	Clean in accordance with instructions (page 20).
Incomplete erasure.	The erasing head is dirty.	Clean the erasing head.
Increased noise or poor reproduction in high frequencies	The head is magnetized.	Demagnetize the head.
Unbalanced tone in high frequencies.	Improper setting of the DD NR switch.	During playing back,set the switch to the same position used in recording.
	The unit is placed near a television set.	Move the deck away from the television set.
The desired selection cannot be located even if you activate the AMS.	There is noise in the space between selections.	Rerecord the tape if you can, and insert a blank space of four seconds using the O button.
	The space is less than four seconds long.	
	The ▶▶ (or ◀◀) button was pressed immediately before the beginning of the following selection.	—
Playback begins in the middle of a selection when the AMS or Blank Skip function is activated.	The selection contains one of the following: — a long pause in the music — a passage of low frequencies or very low volume — a gradual increase or decrease in volume	While the tape is playing, press the ◀◀ or ▶▶ button again.

Noise

Symptom	Cause	Remedy
Hum noise.	The unit is stacked on or under the amplifier.	Separate the unit.
Noise is recorded.	The recording was made near equipment such as a television set or a color monitor, and interference has affected the recording on the tape and the Dolby NR system.	Move the unit away from the television set or color monitor.